

THE EMBODIMENTS OF THE INVENTION IN WHICH AN EXCLUSIVE PROPERTY OR PRIGILEGE IS CLAIMED ARE DEFINED AS FOLLOWS:

1. A radioactively coated medical device characterized in that leachate of a radioisotope from said radioactively coated medical device is of less than about 1%.
2. The radioactively coated device of claim 1, coated with a radioisotope selected from the group consisting of Y-90, Pd-103, Pd-112, Co-55, Co-57, Co-60, Ag-110, Ag-111, Ag-112, Ag-113, Au-199, Cu-64, Re-186, Re-188, Ir-192, Ir-194, Mo-99, Ni-63, In-111, Tc-99m, P-32, P-33, C-14, S-35, Cl-36, I-125, I-131, I-123, I-124, At-211, Gr-68, Ho-166, Gd-159, Pm-142, Gd-153, Yb-169, Am-241, and Yb-160.
3. The radioactively coated medical device of claim 2, wherein said leachate is of less than about 0.5%.
4. The radioactively coated medical device of claim 3, wherein said radioactively coated medical device can comprise a variety of surface geometries, and said medical device is selected from the group consisting of stent, expandable stent, needle, catheter, source for after-loader, source for brachytherapy, brachytherapy seed, delivery wire, seed, wire, protheses, valves, suture and staples or other wound closure device.
5. The radioactively coated medical device of claim 4 further characterized in that said medical device is made from a material selected from the group consisting of aluminum, bronze, brass, copper, zinc, titanium, platinum, tantalum, palladium, stainless steel, zirconium, nitinol, silver, plastic, nylon, Teflon®, silicone, plastic coated wire, enamel-coated glass, ceramic, and glass.

6. The radioactively coated medical device of claim 5, wherein said medical device is a stent.
7. The radioactively coated medical device of claim 5, wherein said medical device is a wire.
8. The radioactively coated medical device of claim 5, wherein said medical device is a seed.
9. The radioactively coated medical device of claim 6, wherein said radioisotope is either P-32, Pd-103, Y-90, or In-111, and said substrate is either nytinol, stainless steel or silver.
10. The radioactively coated medical device of claim 7, wherein said radioisotope is either P-32, Pd-103, Y-90, In-111, or 1-125, and said substrate is nytinol, stainless steel or silver.
11. The radioactively coated medical device of claim 8, wherein said radioisotope is P-32, Pd-103, Y-90, In-111, and said substrate is nytinol, stainless steel or silver.
12. A method of treatment of a patient in need thereof, comprising administering said coated radioactive device as defined in claim 4.
13. The use of said coated radioactive device of claim 4 for the treatment of cell proliferation.

14. The use of said coated radioactive device of claim 4 for the treatment of cell restinosis.
15. A method for coating a substrate with a radioisotope comprising:
  - a) pre-coating said substrate by immersing a cleaned substrate within a seeding solution containing an acid and a non-radioactive metal, at a temperature of between 90° and 95°C to produce a pre-coated substrate;
  - b) baking said precoated substrate at a temperature below the recrystallization temperature of said substrate;
  - c) immersing said precoated substrate within a matrix solution containing a  $\gamma$ ,  $\beta^+$ ,  $\alpha$  or  $\beta^-$  emitting metallic radioisotope with a valence of two, at a temperature of between 90° and 95°C to produce a coated substrate;
  - d) baking said coated substrate at a temperature below the recrystallization temperature of said substrate;
16. The method of claim 15 wherein in said step of immersing, step c), said matrix solution comprises a reducing agent and a stabilizing agent.
17. The method of claim 16 wherein, in the step of pre-coating, step a), said acid is selected from the group of hydrochloric acid and ascorbic acid.
18. The method of claim 17 wherein said acid is ascorbic acid.
19. The method of claim 18, wherein said metallic radioisotope is selected from the group consisting of Y-90, Pd-103, Pd-112, Co-55, Co-57, Co-60, Ag-

110, Ag-111, Ag-112, Ag-113, Au-199, Cu-64, Re-186, Re-188, Ir-192, Ir-194, Mo-99, Ni-63, In-111, Tc-99m, P-32, P-33, C-14, S-35, Cl-36, I-125, I-131, I-123, I-124, At-211, Gr-68, Ho-166, Gd-159, Pm-142, Gd-153, Yb-169, Am-241, and Yb-160.

20. The method of claim 19, wherein said metallic radioisotope is Pd-103.
21. The method of claim 19, wherein said metallic radioisotope is P-32
22. The method of claim 19, wherein said metallic radioisotope is Y-90.
23. The method of claim 16 wherein said stabilizing agent is EDTA and said reducing agent is hydrazine sulfate.
24. The method of claim 23 wherein the pH of said matrix solution is from about 7 to about 12.
25. The method of claim 15, wherein, in the baking steps, steps b) and d), said coated substrate is baked at a temperature from about 250° to about 1000°C.
26. The method of claim 25, wherein said coated substrate is baked at a temperature from about 350° to about 450° C.
27. The method of claim 15 wherein step d) is followed by a step for determining leachate of said metallic radioisotope from said coated substrate.

28. The method of claim 27, wherein said leachate is below 0.2% per 15 minutes.
29. The method of claim 15, wherein steps a) through d) are automated.
30. The method of claim 15, wherein said substrate is a medical device.
31. The method of claim 30 wherein said medical device can comprise a variety of surface geometries, and is selected from the group consisting of: stent, expandable stent, needle, catheter, source for after-loader, source for brachytherapy, brachytherapy seed, delivery wire, seed, wire, protheses, valves, suture, and staples or other wound closure device.
32. The method of claim 31 wherein the medical device is a stent.
33. The method of claim 31 wherein the medical device is a wire.
34. The method of claim 31 wherein the medical device is a seed.
35. The method of claim 15 wherein said substrate is metallic.
36. The method of claim 15 wherein the substrate is stainless steel.
37. The method of claim 15 wherein the substrate is nitinol.

38. A medical device prepared using the method of claim 15.
39. The medical device of claim 38, wherein said medical device can comprise a variety of surface geometries, and is selected from the group consisting of: stent, expandable stent, source for after-loader, source for brachytherapy, brachytherapy seed, delivery wire, catheter, seed, wire, prostheses, valves, sutures, and staples or other wound closure device.
40. The medical device of claim 39, wherein said medical device is a stent.
41. A method of treatment of a patient in need thereof, comprising administering said coated radioactive device as defined in claim 38.
42. The use of said coated radioactive device of claim 38 for the treatment of cell proliferation.
43. A method for coating a metallic medical device with a radioactive isotope comprising:
  - a) immersing said metallic medical device into an aqueous salt solution at a pH of about 10 to about 12 and comprising a radioactive isotope, said metallic medical device acts as an anode;
  - b) inserting a cathode
  - c) applying a current to said anode;
  - d) removing said current from said anode, rinsing said metallic medical device and allowing to air dry.

44. The method of claim 43, wherein after step d), the medical device is baked at a temperature below the recrystallization temperature of the medical device.
45. The method of claim 43, wherein said metallic medical device is a silver medical device, and said radioactive isotope is I-125.
46. The method of claim 45, wherein said step of applying comprises applying a current of from about  $15\mu A$  to about  $20\mu A$ , for about 2 hours.
47. A radioactively coated medical device made by the method of claim 43.
48. The radioactively coated medical device of claim 47, wherein said radioactively coated medical device can comprise a variety of surface geometries, and is selected from the group consisting of: stent, expandable stent, source for after-loader, source for brachytherapy, brachytherapy seed, delivery wire, catheter, seed, wire, prostheses, valves, sutures, and staples or other wound closure device.
49. The radioactively coated medical device of claim 48, wherein said medical device is a stent.
50. The radioactively coated medical device of claim 48, wherein said medical device is a seed.
51. The radioactively coated medical device of claim 48, wherein said medical device is a wire.

52. The radioactively coated medical device of claim 1, further comprising an outer coating material, wherein said outer coating material is either a polymeric or a metallic coating.

54. The medical device of claim 38, further comprising an outer coating material, wherein said outer coating material is either a polymeric or a metallic coating.

55. The radioactively coated medical device of claim 47, further comprising an outer coating material, wherein said outer coating material is either a polymeric or a metallic coating.